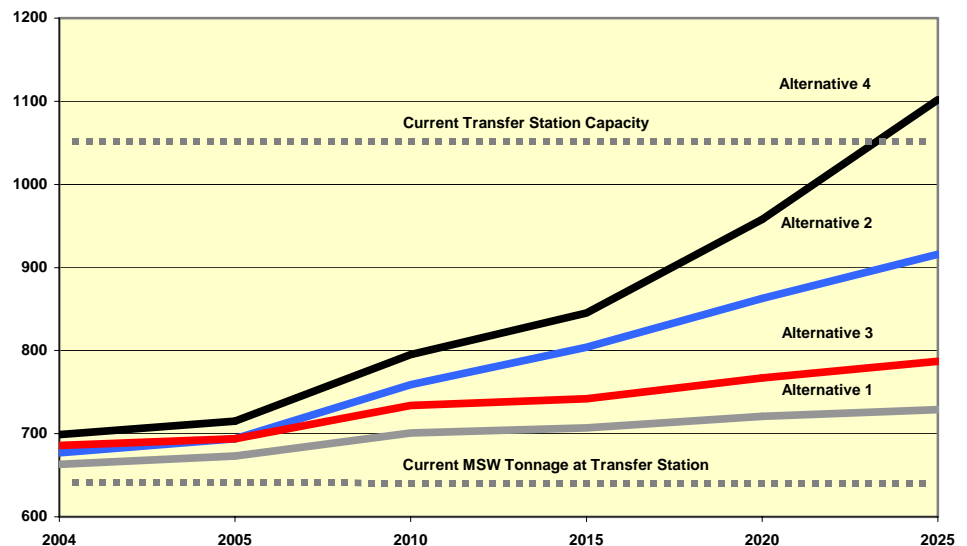


Table 6-13. Projections of MSW Handled at I-66 Transfer Station or Sent Directly to the E/RRF, 2004–2025 (in thousands of tons)

Year	MSW Sent to Transfer Station				MSW Sent Directly to E/RRF			
	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 1	Alt. 2	Alt. 3	Alt. 4
2004	663	677	686	699	168	172	174	177
2005	673	694	694	715	171	176	176	182
2010	701	759	734	795	178	193	186	202
2015	707	804	742	845	179	204	188	214
2020	721	863	767	958	183	219	195	193
2025	729	916	787	1,102	185	233	200	139

Figure 6-4. Projections of County MSW Handled at I-66 Transfer Station 2004–2025 (in thousands of tons)



Fairfax County's MSW transfer system (excluding yard waste and special wastes) must handle an additional 66,000 to 403,000 tons per year by 2025.

The county projects that the I-66 Transfer Station must handle an additional 66,000 to 403,000 tons per year of MSW by 2025. The current I-66 Transfer Station capacity is roughly 3,500 tons per day (1,050,000 tons per year); capacity is based on the number of county transfer trucks, bays, and days of operation. Therefore, the county expects the I-66 Transfer Station to have sufficient capacity to handle these projections, with the exception of Alternative 4. For Alternative 4, MSW quantities will exceed the current I-66 Transfer Station capacity between 2020 and 2025.

SWMP Actions

Table 6-14 shows Fairfax County's SWMP actions for the transfer of MSW. The county selected SWMP actions based on their alignment with the SWMP objectives (in Chapter 4) and their ability to close the gaps

between the county's current SWM system and that required in the future. These SWMP actions are discussed in more detail in Chapter 11.

Table 6-14. Fairfax County MSW Transfer SWMP Actions

MSW Transfer SWMP Actions
Continue using the current transfer system
Reconfigure or construct waste handling areas at the I-66 Transfer Station, including unloading areas for citizens and commercial cash customers (for increased safety and efficiency)
Add transfer capabilities to the I-95 Landfill Complex, if increases in transfer quantities or waste exchange agreements require it

Disposal

Fairfax County currently uses the E/RRF as its primary disposal method for MSW.

Current Programs

Fairfax County currently uses the I-95 Energy/Resource Recovery Facility (E/RRF) as its primary disposal method for MSW and uses out-of-county sanitary landfills to handle the "overflow" waste from the E/RRF. When MSW quantities in the county exceed the capacity of the E/RRF, the county diverts some trucks from the transfer station to out-of-county landfills rather than to the E/RRF. The county disposes of the ash generated from the E/RRF in the Area 3 Ash Landfill at the I-95 Landfill Complex.

Energy Resource Recovery Facility



The E/RRF is one of the largest "mass burn" waste-to-energy (WTE) facilities in the United States. It is located at the I-95 Landfill (which is presently used for ash disposal only). Covanta Fairfax, Inc. (CFI), a private firm, owns and operates the E/RRF under a long-term service agreement with the county.

Fairfax County endorsed the construction of a WTE facility in the mid-1980s to prolong the life of the I-95 Landfill and to provide a viable longer-term solid waste management alternative to landfilling for waste generated in the county. The construction of the E/RRF began in 1988 and operations commenced in June 1990.

Operating the E/RRF is an environmentally effective and economically efficient means to dispose of MSW. The current business model allows the county to charge a competitive MSW disposal fee for contract haulers. The tip fees paid to CFI are used to pay the bonds that financed the construction of the E/RRF. The capital cost of the facility, not including

“For every one million tons of refuse processed at our facilities, we offset the need to use about 1.67 million barrels of oil to generate the same amount of electricity. That also means offsetting the emissions that the oil would have created. In addition, because the process reduces the volume of refuse, we conserve valuable landfill space.”

financing charges, underwriting fees, and construction of utilities was \$195 million. The bonds were refinanced in 1998 and will be completely paid in 2011.

The E/RRF reduces the volume of solid waste by 90 percent. The byproducts of the combustion process, bottom and fly ash, are typically less than 28 percent by weight of the incoming refuse processed. In FY2003, ash residue was 24.9 percent by weight of waste combusted.

The E/RRF uses the waste to generate up to 91 megawatts of electricity; 11 megawatts are required to operate the facility and roughly 80 MW are sold to Virginia Power. This electricity powers about 70,000 homes in the area.

The facility also recovers and recycles ferrous and nonferrous metals; in 2003, 22,204 tons of ferrous metals and 318 tons of nonferrous metals were recovered, representing 2.5 percent of the total municipal waste combusted.

The E/RRF reduces disposal volume, recycles metal, generates electricity, and reduces landfill waste management concerns (leachate, capping, etc.) at a cost that is comparable with landfilling.

To limit the escape of odors from the process, the E/RRF building structure containing the receiving area, refuse storage pit, cranes, and hoppers is maintained at less than atmospheric pressure and a misting system near the doors is employed to reduce odors.



Steam from waste combustion is routed to two steam turbine-generators for power generation. A two-turbine design allows for improved reliability: the facility can continue to produce electricity in case one turbine is off-line for maintenance.

The E/RRF operates using mass burn technology, which involves the combustion of minimally processed or non-processed refuse. The facility is constructed with four 750-ton-per-day waterwall furnaces, each designed to operate independently. The facility design allows for the construction of a fifth furnace, if needed and permitted for future operations.

The E/RRF is equipped with state-of-the-art pollution prevention technology.

Pollution Control Equipment

The E/RRF manages many factors to maximize the combustion of the solid waste and to control the generation of byproducts, including boiler temperature, residence time in the boiler, and underfire and overfire air supply. For example, overfire air (air delivered to the boilers above the

feed table) assists in maintaining boiler temperatures between 1,800°F and 2000°F to ensure complete combustion of organic gases and carbon monoxide.

Air pollution equipment for each boiler unit consists of a semi-dry acid gas scrubber, carbon injection system, aqueous ammonia injection system, and fabric filter baghouse. In the scrubbers, atomized lime is sprayed into the flue gas stream to react with and neutralize acid gases (primarily sulfur dioxide and hydrogen chloride). The carbon injection system assists in the removal of mercury, and the aqueous ammonia injection system assists in controlling emissions of nitrogen oxides. A new system of inserting dolomitic lime into the ash further conditions the ash and binds heavy metals, such as lead and cadmium, to the ash residue, preventing the metals from leaching out once the ash is landfilled. The dolomitic lime system ensures that the pH of the ash remains between 8.0 and 11.0.

Particulate matter is removed from the flue gas stream by the baghouses. Each baghouse contains 2,520 bags: 12 compartments of 210 bags each. The baghouses are designed for full operation using 10 of the 12 compartments. The baghouses are over 99.9 percent effective in removing particulate matter. Fly ash from the air pollution control equipment is directed to the ash discharger (explained above) for quenching.

**Recent air monitoring
data confirmed the
following percent
removals:**

Sulfur Dioxide—94.5%
Hydrogen Chloride—98.2%
Mercury—93.4%
Nitrogen Oxides—45%

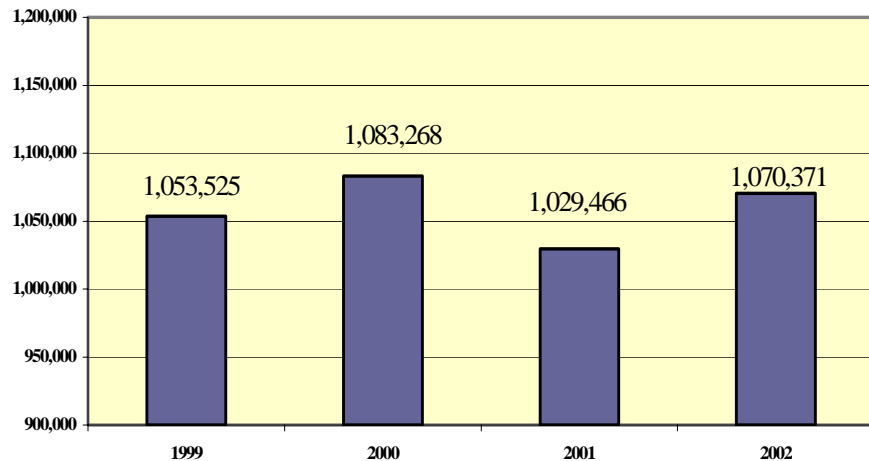
Continuous emissions monitors located in the stack flues record emissions of carbon monoxide, sulfur dioxide, nitrogen oxides, opacity (a measure of particulate matter), and oxygen.

Because of the continuous monitoring of all the gases and ash leaving the facility and the application of state-of-the-art pollution prevention technology, the facility remains in compliance with EPA and VDEQ permits and guidelines.

Past and Present Rate of Use

The E/RRF operates 24 hours per day and 365 days per year. The facility burns waste mostly from Fairfax County, but also takes limited amounts of waste from other jurisdictions as part of waste exchange or longstanding agreements. Figure 6-5 shows the tons of waste processed by the E/RRF between 1999 and 2002.

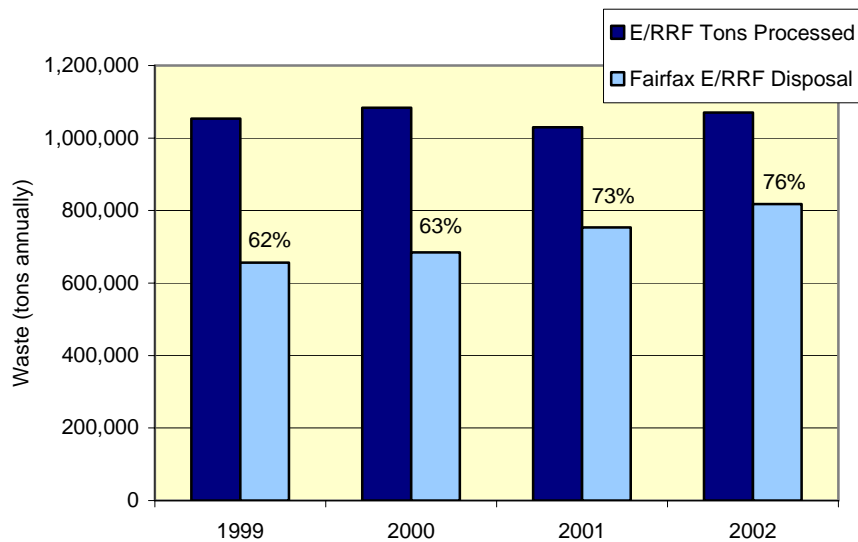
Figure 6-5. E/RRF, Tons of Waste Processed, 1999-2002



Fairfax County must provide a contracted amount of solid waste (930,750 tons per year) to the E/RRF, referred to as the Guaranteed Annual Tonnage (GAT).

Fairfax County must provide a contracted amount of solid waste (930,750 tons per year) to the E/RRF. As a result, Fairfax County has developed agreements and waste exchanges with other jurisdictions to accept MSW for disposal at the E/RRF. As presented in Figure 6-6, county-generated waste constituted between 62 and 76 percent of the waste processed by the facility from 1999 to 2002.

Figure 6-6. Fairfax County Portion of Waste Combusted at E/RRF, 1999-2002



Capacity and Availability

The E/RRF processing capacity is roughly 3,000 tons per day, with 15,000 tons of storage capacity.

The E/RRF storage capacity is approximately 15,000 tons in the refuse storage pit, which is equivalent to 5 days of continuous processing. E/RRF processing capacity is 3,000 tons per day of solid waste. If waste generation rates in Fairfax County exceed this amount, other waste disposal options may be required.

Operation of the E/RRF requires sufficient waste quantities to continuously feed the boilers. Fairfax County must manage MSW collection and disposal in order to keep the boilers operational. Fluctuations in waste volumes or temporary interruptions in waste collection (such as snow events or power outages) can shut down one or more boilers in the E/RRF and reduce the facility's operating capacity.

E/RRF Inventory Management

The primary emergency backups for the E/RRF are out-of-county landfills. The Area 3 Ash Landfill at the I-95 Landfill Complex is permitted to accept MSW in case of an emergency shutdown of the E/RRF. The landfill was closed to MSW in 1995; the ash landfill is not a viable long-term disposal option for Fairfax County when waste generation exceeds the processing capacity of the E/RRF.



Fairfax County uses out-of-county landfills to handle E/RRF overflow waste.

The primary option to handle “overflow” waste is to transport MSW to one of the contracted landfills outside of the county. Most of these have sufficient capacity to handle the current out-of-county landfill requirements over the next 20 years. Some, however, have quarterly permit limits that cap the MSW quantity accepted. Although these landfills may have sufficient capacity, they may not be available to accept MSW from the county in the quantities that are needed daily.

(See the “Sanitary (MSW) Landfills” section of this chapter for the annual tonnage, estimated years remaining, distance from the I-66 Transfer Station, and daily tonnage capacity of the largest private landfills in Virginia.)

Existing Contracts with Haulers and Municipalities

CFI and the county currently have a 20-year operating agreement, with the county guaranteeing at least 930,750 tons of waste each year to the facility until 2011. Fairfax County uses the I-66 Transfer Station and contracts with collection and disposal companies and local jurisdictions to manage the quantities of waste delivered to the E/RRF. The county uses the following efforts to provide the guaranteed annual tonnage (GAT) to the E/RRF:

- Agreement with Prince William County to exchange yard waste generated in Fairfax County for Prince William County MSW;
- Agreement with the District of Columbia to deliver waste to the E/RRF (this agreement may not be extended beyond its current expiration);